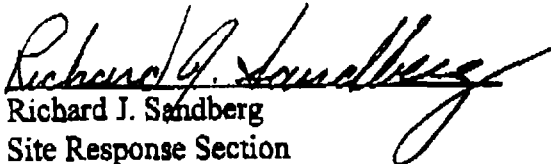


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FIVE-YEAR REVIEW REPORT
NUTTING TRUCK AND CASTER SITE
FARIBAULT, MINNESOTA

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Date

I. PURPOSE

On behalf of the United States Environmental Protection Agency (EPA), the Minnesota Pollution Control Agency (MPCA) has conducted a Five-Year Review of the Remedial Action (RA) at the Nutting Truck and Caster Site (Site), Faribault, Minnesota. This review evaluates whether the RA continues to protect public health and the environment.

Section 121(c) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and Section 300.430(f)(4)(ii) of the National Oil and Hazardous Substance Contingency Plan (NCP), require that periodic (no less often than five years) reviews be conducted for sites where hazardous substance, pollutants, or contaminants remain at the site above levels that disallow unlimited use and unrestricted exposure following the completion of remedial actions for the site.

OSWER Directive 9355.7-02 (Structure and Components of Five-Year Reviews, May 23, 1991) provides that EPA will conduct five-year reviews as a matter of policy (Policy review) at: 1) sites where no hazardous substances will remain above levels that allow unlimited use and unrestricted exposure after completion of the RA, but the cleanup levels specified in the ROD will require five or more years to attain; and (2) sites addressed pre-SARA at which the remedy, upon attainment of the cleanup levels, will not allow unlimited use and unrestricted exposure. MPCA has conducted this five-year review in accordance with item 2) of the policy.

The level of the review is based on site-specific considerations, including the nature of the response action, the status of on-site response activities, and proximity to populated areas and sensitive environmental areas. Consistent with the previous five year review, MPCA has conducted a Level I review at the Site, which is a minimum evaluation of protectiveness. The Level I review conducted at the Site consisted primarily of a review of documents associated with the RA and a site visit.

A Response Order by Consent (Consent Order) signed by the responsible party and by the MPCA on September 22, 1987, required the Nutting Company to perform the RA. The EPA was not signatory to the order. A Remedial Action Plan (RAP) was attached as an Exhibit to the Consent Order. The major component of the selected remedial action was the installation of a ground water extraction well system.

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II. SUMMARY OF SITE CONDITIONS

A. Site History

The Nutting Company was formerly located at 1221 Division Street in Faribault (Rice County), Minnesota (Figure 1). Between 1891 and 1984 Nutting manufactured and distributed casters, wheels, handtrucks and towline trucks at its Faribault facility. Adjacent land use was originally agricultural, and now consists of mixed residential, commercial, and light industrial.

Prior to 1970, Nutting disposed foundry wastes in an abandoned gravel pit at the southern end of the site (Figure 2). Beginning in 1959, Nutting used a seepage pit in the northwest corner of the gravel pit for disposal of waste and sludges, including waste solvents. This operation continued until April 1979, when the Minnesota Pollution Control Agency (MPCA) issued a Notice of Noncompliance to the company regarding these disposal practices. In 1980, under the direction of MPCA, Nutting excavated materials and contaminated soils associated with the seepage pit, and backfilled and paved the excavated area. The MPCA concluded that the excavation effectively removed all source materials associated with disposal practices in the former sludge pit.

The city of Faribault operates five municipal wells, the nearest of which is located approximately one-half mile down gradient (north) of the Nutting facility (Figure 1). In October and November 1982, well water analyses indicated all five municipal wells were contaminated with trichloroethylene (TCE) and 1,2-dichloroethylene (12DCE), a degradation product of TCE.

From 1979 to 1983, Nutting installed six monitoring wells on its property, including one upgradient and one downgradient from the former disposal pit. Analytical results indicated ground water beneath the former pit was contaminated with cadmium, lead, cyanide, methylene chloride, TCE, and xylene. TCE was also detected in wells upgradient and at the boundary of the Nutting property.

On September 8, 1983, the Nutting site was placed on the EPA's National Priorities List (NPL) of abandoned or uncontrolled hazardous waste sites, eligible for investigation and cleanup under Superfund.

On April 26, 1984, MPCA issued a Consent Order to the Nutting Company to conduct a Remedial Investigation (RI) to determine the extent of contamination at the site and the effect of contamination on the city's municipal wells. In 1984, the Nutting Company moved its operations to South Dakota.

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B. Results of Site Investigations

1. Geology and Hydrogeology

The uppermost geologic unit is glacial outwash, which thickens northward and is underlain by the St. Peter Sandstone. Together they comprise the upper aquifer. The base of the St. Peter is typically shaley, and although this condition is present at the site (rock coring RC-3), the presence of dissolved contamination beneath the shaley zone indicates the basal St. Peter retards but does not prevent vertical migration of ground water. The Prairie du Chien Group (Oneota and Shakopee Dolomites and New Richmond Sandstone) underlies the St. Peter Sandstone, and comprises the Prairie du Chien Aquifer.

The lateral hydraulic gradient in the upper aquifer at the site is northward, but this is likely a local effect (analysis of water table hydraulic gradient at nearby leaking underground storage tank sites indicates generally eastward ground water flow). The lateral hydraulic gradient in the Prairie du Chien Aquifer is northerly, in the general direction of the Faribault municipal wells (however, because the Prairie du Chien Aquifer is fractured, actual flow directions may differ from measured lateral hydraulic gradient). Water level measurement during the RI confirmed a slight upward vertical hydraulic gradient between the Prairie du Chien Aquifer and the upper aquifer.

RI water quality monitoring data detected TCE (at concentrations up to 570 µg/L) and 1,2-DCE in shallow ground water beneath and downgradient of the Site. TCE was detected in one on-site well within the Prairie du Chien Aquifer.

2. Soil and Surface Contamination

Nutting drilled several soil borings in the southern portion of the site to determine whether non-foundry wastes were disposed in the old gravel pit area. Boring samples were analyzed by head space gas chromatography on-site. Detected contamination was limited to surface or near surface soils, and was attributed to spillage during drum handling in those areas.

III. REMEDIAL OBJECTIVES AND RESULTS

A. Ground Water Remedial Objectives

The MPCA Board Item presenting the Consent Order stated "the purpose of the [Response Action Plan] RAP is to mitigate migration from the Nutting site of contaminated ground water in the alluvium and upper St. Peter aquifers and thereby ensure protection of the downgradient aquifer for future use as a drinking water supply." MPCA files state that calculations indicated the cleanup level of 50 ppb TCE would ensure mitigation. According to the Board Item, "The RAP specifically requires Nutting to (1) pump out contaminated ground water until a concentration of 50 ppb of TCE is consistently achieved in the alluvium at the Nutting property boundary, and (2) monitor ground water to assess the effectiveness of the pump out system." The Consent Order is "based on information known to the parties on the effective date [9/22/87] of this order...."

According to the RAP, the pump out system would intercept and mitigate the identified contaminant plume in the ground water as it leaves the Nutting property; the drift pump out well (P18) was designed to guarantee capture of any contaminant plume leaving the Nutting property. The system must mitigate the most significant portion of any contaminant plume which might be downgradient of the pumping wells. The discharge is aerated to volatilize the contaminants. The monitoring is conducted for RA effectiveness and National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) permit compliance. Periodic reports provide evaluation of the effect of the pump out system. The source remediation, excavation and closure of the disposal pit area, under MPCA-approved activities previous to the RAP, is considered to be complete and adequate.

B. Ground water Extraction System

The ground water remedial action, described in the RAP, consists of two recovery wells (P18 in the glacial drift, or outwash, and P17 in the St. Peter; Figure 3), a cascade or air stripping treatment system with discharge through a corrugated pipe connected to the storm sewer, and eventual discharge to Crocker's Creek under a MPCA NPDES/SDS permit. According to file documentation, the system has continuously operated since November 25, 1987.

C. Ground Water Monitoring Network

The RAP established a Ground Water monitoring network (Figure 2) to assess the effectiveness of the ground water pumpout system, and to detect future contaminant migration from the Site. Since 1987, Nutting has performed semi-annual sampling at

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eight wells (including the two pumpout wells), the catch basin, and the outfall area at the discharge to Crocker's Creek, although MPCA staff recently reduced this frequency to annually. The ground water samples are analyzed for TCE, 1,1-dichloroethylene (11DCE), cis-12DCE, and trans-12DCE.

D. Results

Extraction system monitoring verifies hydraulic containment within a portion of the upper aquifer.

Contaminant levels are approaching asymptotic conditions in extraction wells P-17 and P-18 at levels close to the MCL for TCE (Figure 4). Most monitoring well sampling data indicate a similar gradual decrease in contaminant levels in the ground water. However the TCE concentrations in well B4 (St. Peter Aquifer) have stabilized above the site cleanup level (Figure 5).

IV. REVIEW OF RISK CONSIDERATIONS**A. Human Health Risk**

At this site, TCE is the contaminant of concern. The Minnesota Health Risk Limit (HRL) of 30 ug/l TCE is the promulgated concentration of a ground water contaminant that can be safely consumed daily for a lifetime. The legislation requires the HRLs to be used as criteria for Best Management Practices and Water Resource Protection Requirements. State ground water protection programs use the HRLs as criteria for their purposes. The MDH uses HRLs as criteria to:

- 1) advise consumers and owners of private well drinking water supplies, which are not regulated for contamination by the MDH;
- 2) evaluate options to reduce exposure where no federal standard (e.g. MCL) exists;
- 3) evaluate environmental projects;
- 4) evaluate site impacts on public health and make recommendations.

The Maximum Contaminant Level Goal (MCLG) is 0 ug/l for TCE because we really do not know enough about the chemical and therefore it is best not to drink water with any amount of contamination if at all possible.

The federal Maximum Contaminant Level (MCL) for regulating public water supplies is 5 ug/l TCE; the MCL is based on several factors, including the MCLG, health risk and other factors like the cost to treat water to the MCL in public supplies. The MDH enforces this criterion.

Human health risk has been evaluated by the Minnesota Department of Health on behalf of the Agency for Toxic Substances and Disease Registry (ATSDR) in "Site Review and Update, Nutting Truck and Caster", October 24, 1995. The MDH concluded the following about the Nutting site:

- 1) The ground water remains contaminated with TCE in the drift, St. Peter, and Prairie du Chien/Jordan aquifers beneath the site.
- 2) The recent levels of TCE in the ground water have been below the cleanup level of 50 ug/l, but remain above the MCL of 5 ug/l [the enforceable standard in community drinking water wells] which may not be attainable with the current pump-out system.
- 3) Channelized flow in the Prairie du Chien results in unpredictable flow rates and directions.
- 4) The Faribault municipal well field, impacted by TCE, is down gradient from the Site and other potential sources.
- 5) An unknown source may be impacting the Faribault municipal wells.
- 6) The observed TCE concentrations fall in the range of the MCL, the Minnesota HRL of 30 ug/l, and the cleanup level of 50 ug/l.

A separate document, "Health Consultation, Faribault Municipal Well Field", addresses contamination in the Faribault city wells.

B. Ecological Risk

The former disposal area has been capped and fenced, minimizing or eliminating access by flora and/or fauna. The ground water contamination is intercepted by the pumpout wells; should they fail, the municipal drinking water wells are expected to intercept the dissolved TCE plume before it could enter the Cannon River. Therefore there are no identified ecological receptors.

V. APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS) REVIEW

By established EPA policy, Five-Year Reviews are to evaluate newly promulgated or modified Federal and State environmental laws as they affect remedial action at the site under review. Because the April 1984 Consent Order for the Nutting site pre-dated establishment and use of ARARS, the Nutting Consent Order did not address ARARS for construction, maintenance and monitoring of the remedial action. The potential ARARS to be reviewed¹ are:

¹ In the previous five year review, the Minnesota Department of Health (MDH) Recommended Allowable Limits (RALs; Release No. 3) were identified as "to-be-considered criteria". However, the RALs were never promulgated as rule, and therefore were unenforceable. Moreover, since that five year review was

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1. Safe Drinking Water Act (SDWA), 40 CFR Parts 141-143. Establishes MCLs for ground water remediation.
2. National Pollution Discharge Elimination Permit. Permit Number 0057541.
3. Minnesota Rule 4717.7100 to 4717.7800. Health Risk Limits (HRLs) for ground water contaminants.
4. Minnesota Rules Ch. 7050. Discharge to a surface water body.
5. Minnesota Rule 7060. Establishes uses and nondegradation goal for ground water.
6. Minnesota Rule 4725. Water well code. Establishes standards for the construction, maintenance and sealing of wells.

The remedial action comparative performance standards for ground water are the SDWA MCLs (ARAR #1 above) for public water supplies, and the Minnesota HRLs (ARAR #3 above). Figure 4 shows the MCLs, HRLs, and selected cleanup level for contaminants in ground water at the Nutting Site, along with VOC concentrations in the pump-out wells. Although the site specific cleanup level is greater than the HRLs or MCLs, there is no anticipated cleanup level modification because there is yet no strong evidence linking the Nutting release to impacts measured at the municipal wells. MPCA staff is working with Nutting to devise a field program to test this hypothesis.

After cascade treatment, pumped ground water is discharged to Crocker's Creek via storm sewer. This discharge is regulated by the requirements of the NPDES/SDS permit issued for discharge (ARAR # 2). The NPDES/SDS permit (MN0057541) establishes site discharge limits, which are monitored in accordance with the requirements of the permit, and reported to MPCA. The NPDES/SDS permit requirements are determined pursuant to Rule 7050 (ARAR #4), discharge to surface water bodies.

Minnesota Rule 7060 (ARAR #5) establishes a nondegradation goal for ground water. The Consent Order also requires, pursuant to Minnesota Statutes, due consideration to economic factors and other material matters affecting the feasibility and practicability of any proposed action.

Minnesota Rule 4725 (water well code, ARAR #6) establishes standards for the construction, maintenance and sealing of production and monitoring wells. The responsibility for maintaining this ARAR falls primarily upon drillers performing work at the site, and enforcement of the code is by the Minnesota Department of Health.

issued the RALs have been replaced by the rule-based and human health risk-based "Health Risk Limits", or HRLs (ARAR # 3, above). The RALs are no longer considered ARARs for the Nutting site.

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In summary, the previous discussion indicates that the following ARARs should be considered for the Nutting site:

- MCLs;
- NPDES permit requirements;
- HRLs;
- water well code.

B. Areas of non-compliance

The current site conditions are evaluated below against the four remaining bulleted ARARs identified above:

MCLs. The MCL for TCE is 5 ug/l. TCE concentrations in the pumping wells have stabilized near (at P17) or slightly above (at P16) the MCL (Figure 4). Monitoring well W13 (Prairie du Chien Aquifer) fluctuates within a range of up to 35 ug/l, but is commonly close to 10 ug/l. Monitoring well B4 (St. Peter) is apparently stable at a TCE concentration (73 ug/l in May 1997) above the MCL. Monitoring well B15 has apparently stabilized at a TCE concentration (2-3 ug/l) below the MCL. All other existing monitoring points are currently below the MCL.

NPDES/SDS. The NPDES/SDS permit requires twice annual sampling for TCE and oil and grease, and measurement of pH and flow rate. The permit requires oil and grease to remain below 10 mg/l, and the pH must remain between 6.0 and 9.0. In addition, there may be no discharge of floating solids, visible foam, or visible oily film. As of the November 1997 sampling, these standards have been met.

HRLs. The HRL for TCE is 30 ug/l. Monitoring well B4 (St. Peter) is apparently stable at a TCE concentration (73 ug/l in May 1997) above the HRL. The TCE concentration in monitoring well W13 (Prairie du Chien) fluctuates up to 35 ug/l, which exceeds the HRL. All other existing monitoring wells and pumpout wells are currently below the HRL.

Water well construction code. There are no known violations of this ARAR.

Project cleanup level. The project cleanup level is 50 ug/l for TCE, measured in the upper aquifer at the Nutting property boundary. Existing monitoring and pumpout wells at the Nutting property boundary (B15, PW17, PW18) currently meet the cleanup level for the site. Monitoring well B4 exceeds the level (73 ug/l in May 1997), although it is not a compliance point. MPCA staff are uncertain about the extent to which the site contamination affects the Prairie du Chien Aquifer beneath or downgradient of the site; this is the reason for the field program to be undertaken in the near future (see section V. above).

VI. SUMMARY OF SITE VISIT

At the time of the site visit (January 30, 1998), MPCA staff (Jim Lundy, Hans Neve) observed that the old disposal pit area was covered by a concrete pad, and it appeared intact and in good condition. The pumping wells were in working order, operating as described in routine monitoring reports submitted by Nutting. An adjustment to the pumpout system in 1996 appears to have solved an earlier problem causing reduced well yields. The Site buildings are now rented as office and warehouse space, or are vacant

VII. RECOMMENDATIONS

According to consultant monitoring reports filed twice yearly, the ground water pumpout system is operating as designed and likely captures the portion of the TCE plume within the upper (drift/St. Peter) aquifer. Review of ground water monitoring data indicates that TCE concentrations in the pumpout wells and most monitoring wells have stabilized below the project cleanup level of 50 µg/L. However, the TCE concentration in one monitoring well (B4, St. Peter Aquifer) has stabilized above the HRL (30 µg/L) for TCE. TCE in monitoring wells above the HRL presents a risk to human health (ingestion).

The TCE concentrations in two monitoring wells (B4, W13) and one pumping well (PW18) are consistently above the MCL (5 ug/l) for TCE. The TCE concentration in pumping well PW17 is stable at the MCL for TCE.

Although the project cleanup level has been achieved in the remaining compliance boundary well B15, as specified in the RAP, ground water in monitoring well B4 is 73 ug/l. The existing remedial system needs testing: 1) to determine whether the contaminant plume is controlled to the cleanup level of 50 ug/l TCE on a long term basis; and 2) to determine whether control of the contaminant plume in the upper aquifer is sufficient to control contamination in the Prairie du Chien Aquifer. MPCA recommends that Nutting continue operating, maintaining, and monitoring the existing pumpout system. In addition, an information search may be conducted to identify innovative technologies which may increase the remedial effectiveness or decrease the required time of remediation. During 1998, MPCA expects to continue investigation of other potentially responsible parties in Faribault which may have released volatile organic compounds that have affected the municipal drinking water supply system.

MPCA staff may request Nutting to perform work to determine whether and to what extent the Nutting TCE plume affects the Prairie du Chien Aquifer. Such work may focus on the effect of the existing pumpout system, and it may entail additional hydrogeologic investigation.

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The existing monitoring well network is sufficient to manage the remedial action. However, if in the future MPCA staff determine that the Nutting ground water contaminant plume has affected drinking water quality in the Faribault drinking water supply system, modifications to the remedial system, monitoring well network, and schedule may become necessary.

VIII. STATEMENT OF PROTECTIVENESS

The ground water extraction system is operational and functional, and the best available information indicates that currently the system adequately protects human health and the environment.

IX. NEXT REVIEW

It is probable that hazardous substances, pollutants or contaminants will remain at the Nutting Truck and Caster Site which will not allow for unlimited use with unrestricted exposure. MPCA will conduct the next Five-Year Review by March 31, 2003. This will be a Level I Review, consisting of review of recent ground water monitoring data and any newly promulgated environmental laws.

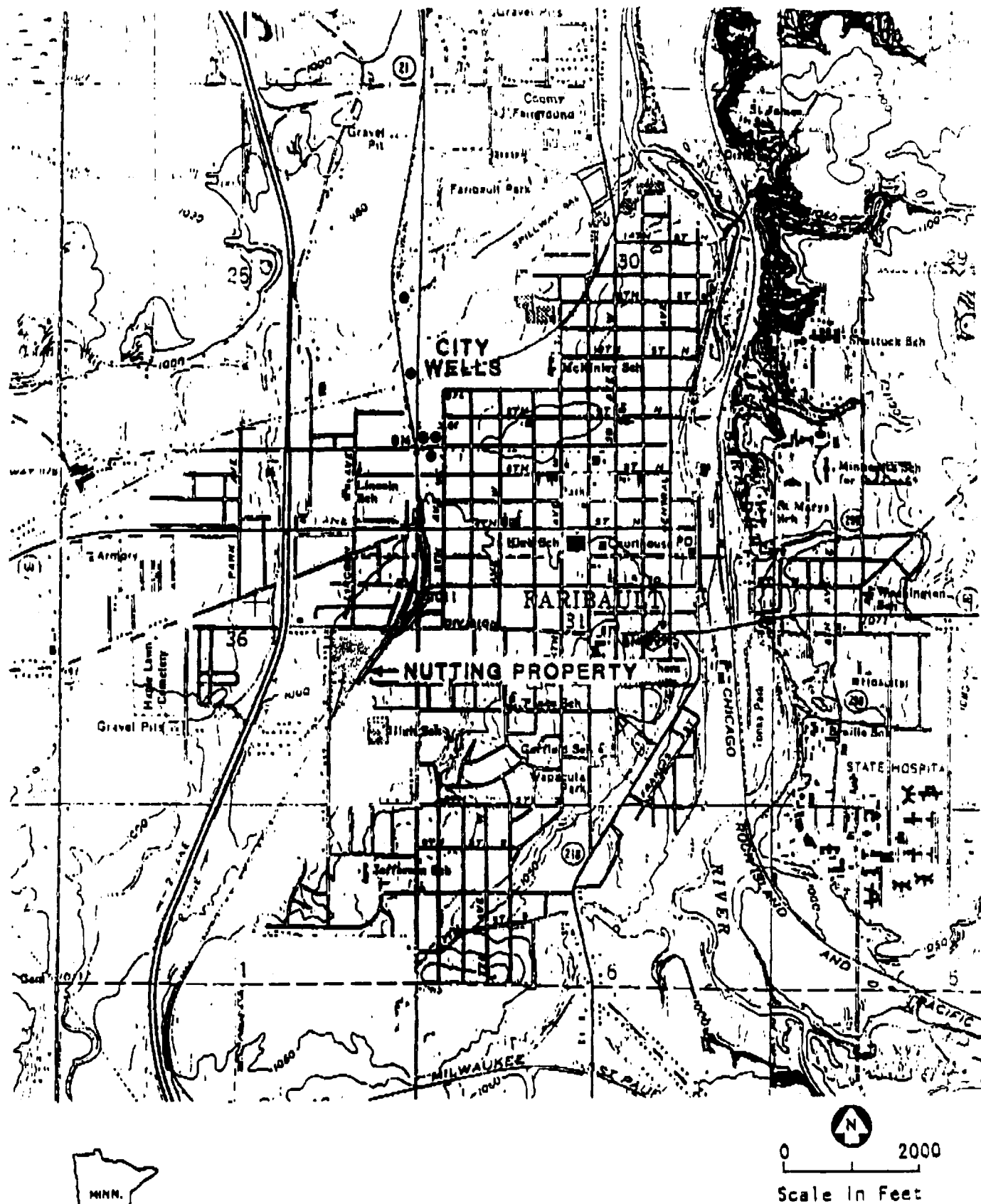


Figure 1
LOCATION MAP
The Nutting Company
Faribault, Minnesota

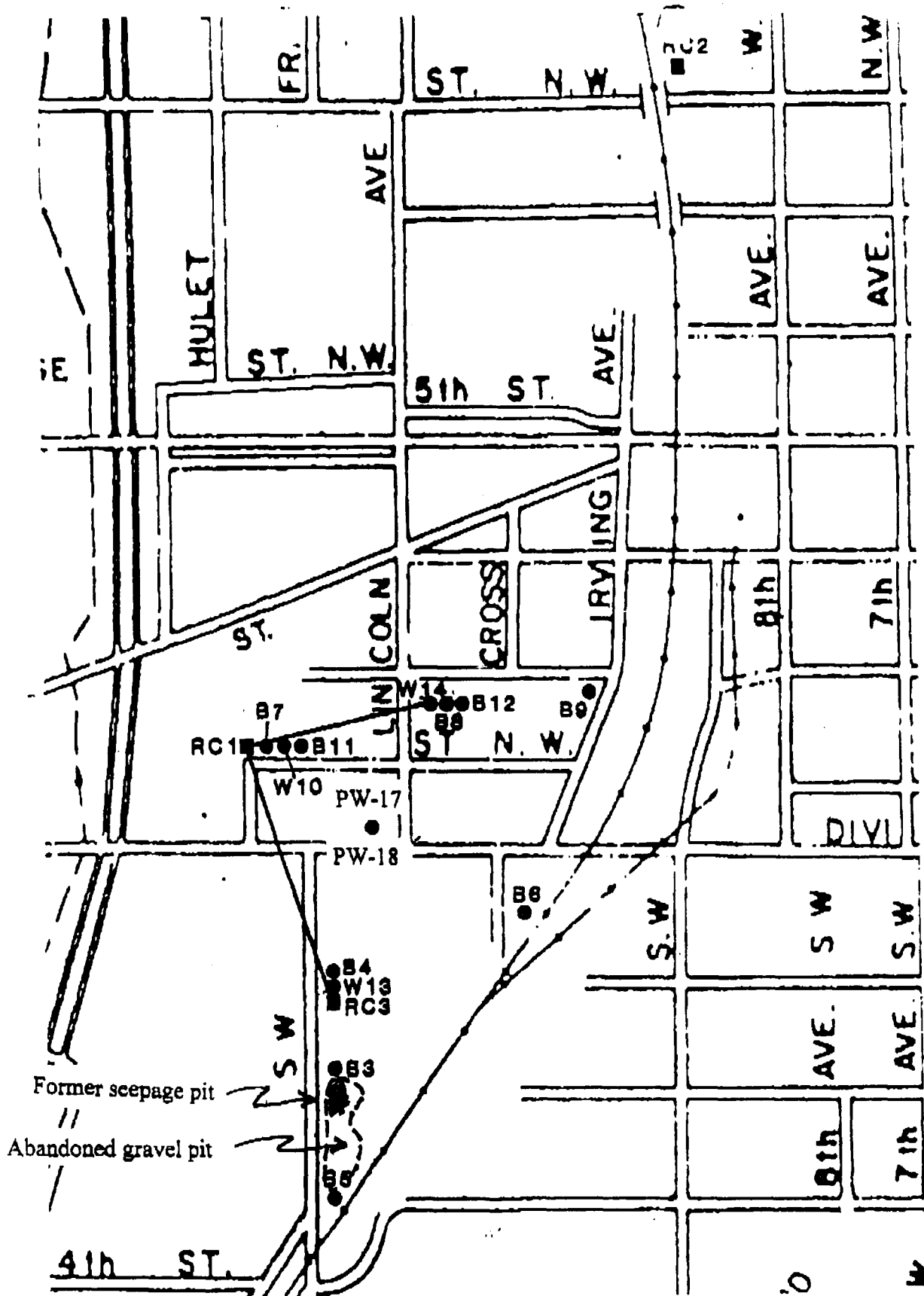


Figure 2.

MONITORING WELL AND
CROSS SECTION LOCATIONS

The Nutting Company
Faribault, Minnesota

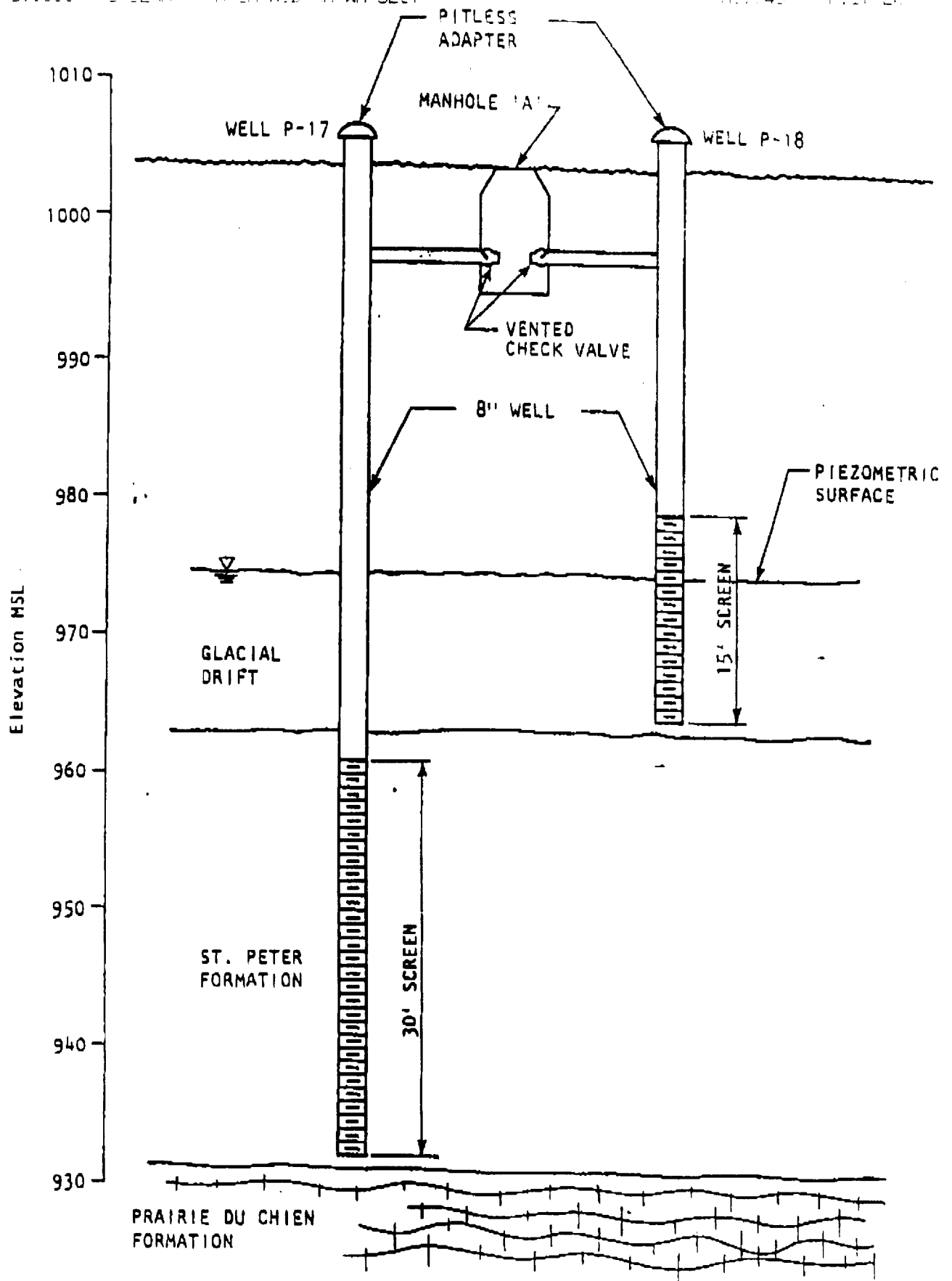


Figure 3.
PUMPOUT WELL CONSTRUCTION
RESPONSE ACTION PLAN
THE NUTTING COMPANY

Figure 4—[TCE] in Wells P17 and P18 vs. Time

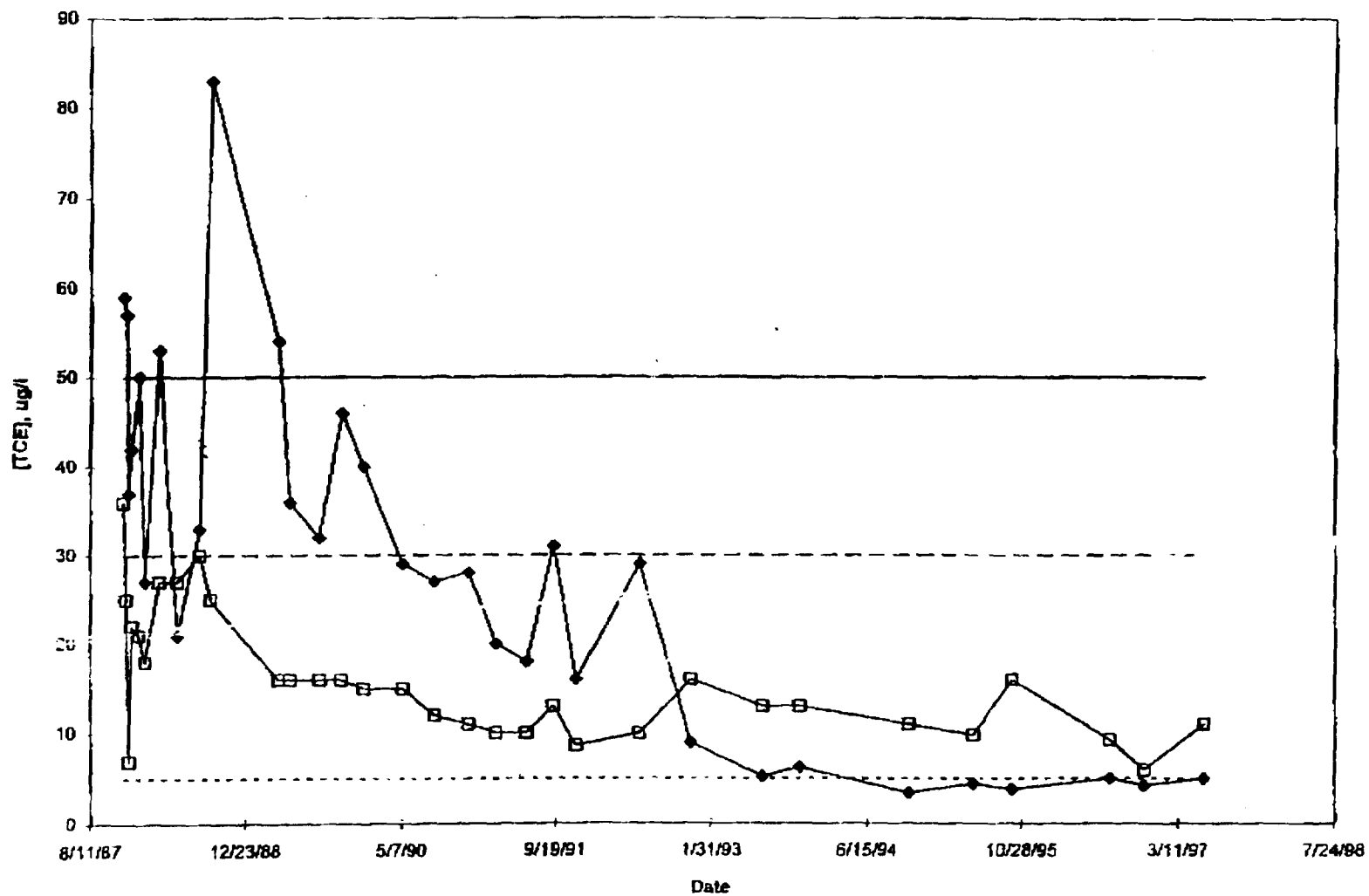


Figure 5—[TCE] vs. Time, monitoring well B4

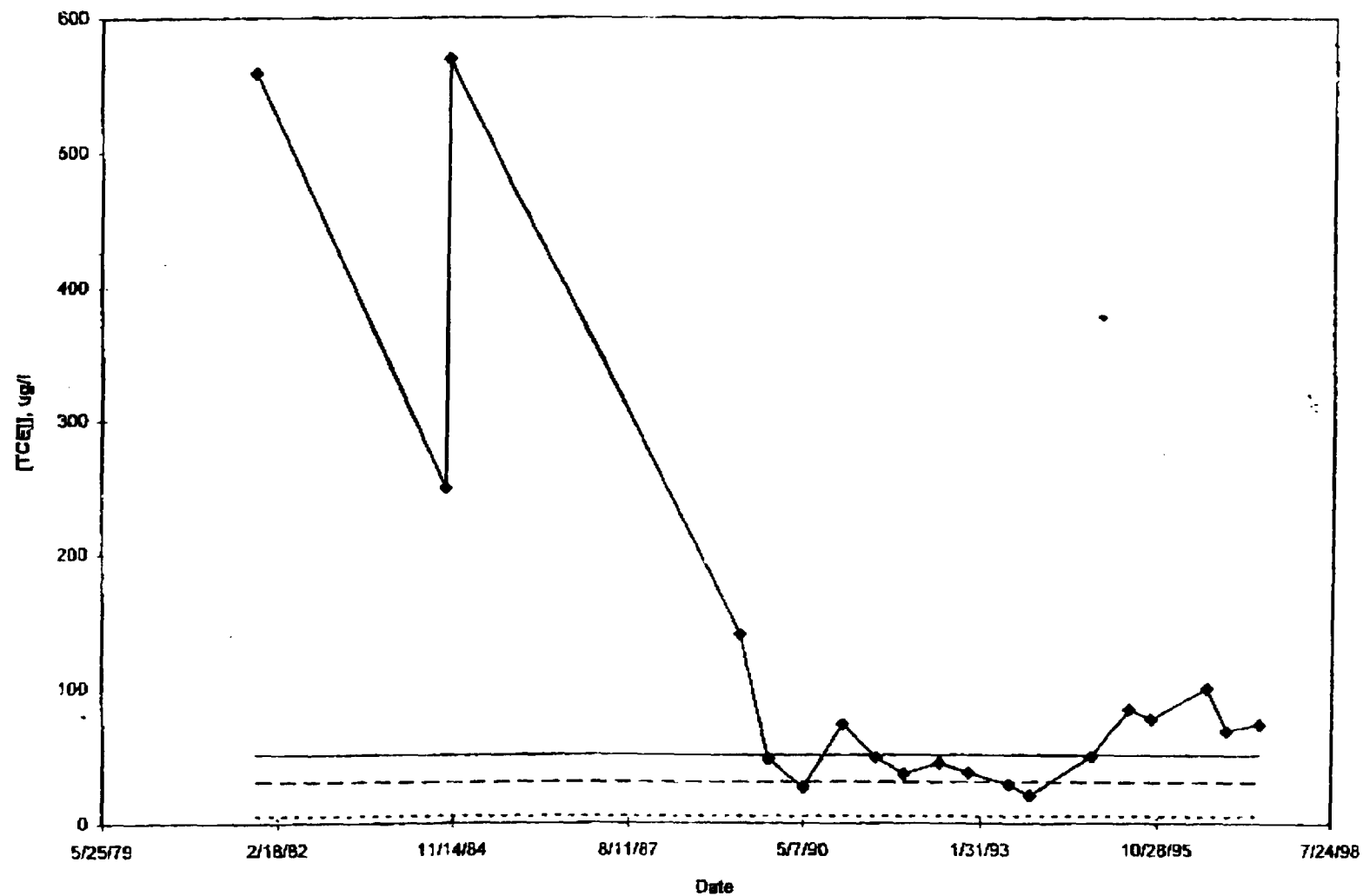


Figure 6--[TCE] vs. time, selected monitoring wells

